

BELLCOMM, INC.

955 L'ENFANT PLAZA NORTH, S.W.

WASHINGTON, D. C. 20024

SUBJECT: Trip Report: Fourteenth Meeting
of the AAP Mission Requirements
Panel - Case 610

DATE: March 12, 1969

FROM: K. E. Martersteck

ABSTRACT

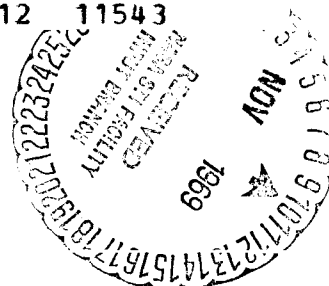
At the fourteenth meeting of the AAP Mission Requirements Panel, held at MSFC on February 25-26, 1969, the following items received particular attention: requirements for operation of the LM/ATM after completion of AAP-3/AAP-4; compatibility of the 4B experiment option; feasibility of launching the LM/ATM after AAP-1/AAP-2 instead of after AAP-3A; weight and performance; and launch windows. The status of continuing effort in each of these areas was discussed.

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MEETING OF THE AAP MISSION REQUIREMENTS
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MEMORANDUM FOR FILE

The fourteenth meeting of the AAP Mission Requirements Panel (MRP) was held at MSFC on February 25-26, 1969. An agenda is attached. Significant items discussed at the meeting are listed by agenda number and summarized below.

14.1 Review of Action Items14.1.1 Requirements for operation of ATM after completion of AAP-3/AAP-4.

As reported at the last MRP meeting, MSFC had send a letter to Headquarters stating that such an operation is feasible. In response Headquarters directed MSFC to make a detailed study of the impact of this unmanned ATM operation on the flight hardware systems and ground support operations including cost and schedule analyses. MSFC took an action item to determine the ground support requirements for this mode of operation and coordinate with the MSC Flight Operations Directorate so that MSFN and mission control impact might be identified. Questions were raised concerning the value of ATM data obtained after AAP-3 departs since there will be great uncertainty regarding the area of the sun being viewed and since the Cluster altitude will be relatively low compared with what the PI's claim they can tolerate for the mission.

14.1.5 Investigate the compatibility of the 4B experiment option.

The Martin Company is working on a detailed crew timeline for this experiment option. The final report on this effort should be available by early May.

The pointing and control requirements are being reviewed under this action item by a joint MSC/MSFC working group. This group has recommended changes to the baseline attitude timeline such as going from AAP-2 passivation attitude directly to X-POP-ZLV instead of going via the gravity gradient attitude. Also there is a new requirement to deploy the OWS solar arrays within an hour after launch. This could pose a flight control problem due to lack of ground coverage during the first half of the initial orbit. The working group is also reviewing the WACS budget. The latest MSFC figures show a nominal requirement for 194,348 lb-sec

impulse (the WACS capacity is 200,000 lb-sec). If $+2\sigma$ atmospheric density were encountered, the requirement would increase to 207,419 lb-sec. Dispersions totaling 46,080 lb-sec were also listed. Based on these figures, there would be no WACS propellant available for experiment pointing.

It has been determined that the 4B option would have a negligible effect on the weight and volume totals of items on the stowage lists.

14.1.7 Investigate the feasibility of launching the LM/ATM mission after AAP-1/AAP-2 rather than after AAP-3A.

Two options (A and B) on the subject sequence were considered: either with or without a revisit mission after the AAP-3A/AAP-4 biomed/ATM mission respectively, and comparisons with the present baseline were made. This whole subject stimulated considerable discussion. The surface has barely been scratched as far as studying the implications of a program change of this magnitude. The current baseline has funding, stowage, and CSM scheduling problems plus excessive unscheduled crew time on AAP-3A. With Option A the funding and stowage problems are compounded and overall success probability is reduced, but the potential returns, particularly in terms of ATM data, are greater. Option B would ease many problems in the baseline such as cost and stowage, but the program content would be considerably reduced, primarily in the ATM area. A presentation of this material is being prepared for the next program baseline review.

14.1.8 Define Baseline Reference Mission update requirements.

It is planned to collect BRM update material essentially on a continuous basis. Specific updates will be issued about every six weeks and include new pages where appropriate and a "flag page" containing both data not warranting a new page and data on pending changes with the identity of a contact for details of each pending change. All BRM holders were urged to submit revision material to F. Littleton, MSC/KM, or any member of the BRM steering committee.

14.2 Weight and Performance Report

During the discussion on this item, it was pointed out that the current CSM weights are based on full RCS tanks (3600 lbs usable propellant) for AAP-1 and AAP-3A, but not for AAP-3. The recommendation was made that AAP-3 also be weight budgeted for a full RCS load so that propellant will be available to adjust the SIWS orbit as necessary to improve the AAP-4 launch opportunities.

Payload margins continue to shrink as more and more pending changes are included in the weight accounting. Details will be published in the monthly Weight and Performance Report.

14.5 New Items: Launch Windows

Since MSC has now taken the position that northerly launches of CSM's using SPS insertion are acceptable, mission planning will assume nominal CSM launches to the north, with southerly launches allowable where possible to increase launch opportunities.

MSFC presented an analysis of means to increase the AAP-4 launch window. Basically, the options are to increase the number of phasing orbits, increase the eccentricity of the phasing orbit or a combination of both. Additional batteries and/or more RCS propellant in the LM/ATM would be required and in most cases the resulting launch window would be only a few times greater than the current value of about three seconds.

The tight launch window is causing consternation at KSC but there appears to be little difference to them between a three-second window and one of 15-20 seconds. A KSC historical review of on-time launch attempts and results stimulated some lively discussion as to the applicability of such data to the AAP-4 situation. The KSC position is that there is no technical reason why we cannot plan to launch on time, but.....!



K. E. Martersteck

1025-KEM-dcs

Attachment

AGENDA

FOURTEENTH MEETING OF THE MISSION REQUIREMENTS PANEL

MSFC

Building 4200, Room 489
February 25, 1969, 12:30 p.m.
February 26, 1969, 8:30 a.m.

14.1 Review of the Action Items

- 14.1.1 State any requirements for operation of ATM after the completion of AAP-3/AAP-4, MRP AI 12.2.
- 14.1.2 Prepare the MRP Documentation Plan, MRP AI 8.1.
- 14.1.3 Prepare Experiment Operations Requirements Section of the MRD for AAP-3A and AAP-3/AAP-4. ESP AI 2.3.
- 14.1.4 Formulate backup program plans for utilization of MDA/AM/OWS and LM/ATM hardware, MRP 10.3.
- 14.1.5 Investigate the compatibility of the "4B" experiment option
 - (a) Crew timeline considerations (Tinius/White).
 - (b) Pointing and control (Sims/Whitacre).
 - (c) Stowage (Thomas/Machell) MRP AI 13.1.
- 14.1.6 Define the current propellant loading tolerances for the Saturn I Launch Vehicle, MRP AI 13.2.
- 14.1.7 Investigate the feasibility of launching the LM/ATM mission after AAP-1/AAP-2 rather than AAP-3A.
 - (a) Programmatic (Thomas/Jenkins).
 - (b) Systems (Thomas/Littleton).
 - (c) Timeline (Lester/White) MRP AI 13.3.
- 14.1.8 Define Baseline Reference Mission (BRM) update requirements, MRP AI 13.4.
- 14.1.9 Determine if the AAP-4 S-IVB is a hazard to the OA. MRP AI 13.5.

14.2 Weight and Performance Report

14.3 KSC Pad 39 Study Report

14.4 LM Critical Timeline

14.5 New Items